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Appl. No. 10/740,482
Amendment dated November 26, 2004
Reply to Office Action of August 25, 2004

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims

1. (currently amended) A device for lining a conduit to be rehabilitated, comprising a movable carriage having an axis, said carriage being adapted to enter and be displaced coaxially through the conduit, and a spray source rotatably mounted to said carriage for rotation about said axis, said spray source including a nozzle through which a fast setting lining mixture is forced out under pressure while said spray source is rotated about said axis and said carriage is axially displaced along the conduit, thereby providing for a uniform distribution of the lining mixture on an inner wall of the conduit, and wherein at least first and second fluid passages are provided for separately feeding first and second components of the fast setting lining mixture to the spray source where the first and second components are mixed together as the lining mixture is being applied, and wherein said spray source comprises a head carrying said nozzle, said head defining a mixing chamber for separately receiving the first and second components of the fast setting lining mixture, said mixing chamber having at least first and second inlet ports respectively connected in fluid flow communication with said first and second fluid passages, said nozzle being in fluid flow communication with said mixing chamber for receiving the lining mixture therefrom, and wherein said head is fitted on a pin for relative movement therealong between a first position in which the head is lowered onto said pin with the pin substantially filling the mixing chamber, thereby simultaneously blocking said first and second inlets, and a second position in which said pin is substantially withdrawn from said mixing chamber, thereby clearing said first and second inlets.

2. (original) A device as defined in claim 1, wherein said spray source includes a rotatable crank axle, said nozzle being mounted at a distal end of said crank axle for rotation about said axis.

3. (cancelled)

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4. (original) A device as defined in claim 1, wherein said nozzle defines an inclined and outwardly flaring slotted spray orifice.

5. (original) A device as defined in claim 2, wherein said nozzle is orientable to selectively spray radially inwardly and radially outwardly relative to said axis.

6. (original) A device as defined in claim 2, wherein said rotatable crank axle includes a crank lever extending at right angles from said axis and a revolving arm extending from said crank lever in parallel to said axis.

7. (original) A device as defined in claim 6, wherein said crank lever is an interchangeable component of variable length.

8. (original) A device as defined in claim 6, wherein said revolving arm carries said nozzle, and wherein said revolving arm is pivotable about a longitudinal axis thereof relative to said crank lever for setting the orientation of said nozzle.

9. (currently amended) A device as defined in claim 6, wherein ~~said spray source further includes a head carrying said nozzle, said head being~~ ~~is~~ displaceable by an actuator to selectively close or open said spray source, said actuator being arranged at right angles relative to ~~said head~~ ~~spraying direction of the device~~ to provide for a compact sprayer configuration.

10. (original) A device as defined in claim 9, wherein said actuator is mounted to said revolving arm for reciprocating a drawer along said revolving arm, and wherein said drawer is connected to said head to transfer the movement imparted thereto by said actuator to said head in a direction perpendicular to said revolving arm.

11. (original) A device as defined in claim 10, wherein said drawer extends on each side of said head, said drawer defining a pair of inclined slots in which roller bearings extending laterally outwardly of said head are constrained to move.

12. (cancelled)

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13. (currently amended) A device as defined in claim 1210, wherein said head has a body defining a cavity for receiving an insert into which said mixing chamber is formed, said nozzle being seated on top of said insert and in fluid flow communication with said mixing chamber for receiving the lining mixture therefrom, and wherein a first nut is threadably engaged with said body for maintaining said insert in place, said nozzle being received in a recess defined in said first nut, and wherein a second nut is threadably engaged in said recess for maintaining said nozzle in place independently of said insert.

14. (original) A device as defined in claim 9, wherein said actuator is a pneumatic cylinder extending along said revolving arm.

15. (currently amended) A device as defined in claim 1, wherein said spray source includes an arm extending in parallel to said axis and mounted for rotation thereabout, said arm being offset from said axis, a said head carrying said nozzle and being displaceable by an actuator for selectively closing and opening said spray source, wherein said actuator extends along said arm, and wherein said head is displaceable in a direction perpendicular to said arm and said actuator.

16. (original) A device as defined in claim 1, wherein said carriage is equipped with a set of rollers for centering said carriage in the conduit to be rehabilitated.

17. (original) A device as defined in claim 6, wherein a counterweight is provided at a free distal end of a lever mounted at right angles to the axis in a direction opposite to said crank lever.

18 to 23. (cancelled)

24. (currently amended) An atomizer for spraying a fast setting lining material on a surface, the atomizer comprising an elongated body having a first axis, a head mounted at one end of said elongated body and defining a mixing chamber for separately receiving the components of the fast setting lining material from separate fluid passages, said mixing chamber having a second axis angularly oriented relative to said first axis, said head carrying a nozzle through which the fast setting lining material is forced out of the mixing chamber

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along said second axis, and a linear an actuator extending oriented along said elongated body first axis for displacing said head in a direction perpendicular to said elongated body along said second axis between a closed position, wherein the components of the fast setting lining material are prevented from reaching said mixing chamber, and an open position wherein the components of the fast setting material are free to flow into said mixing chamber.

25. (original) An atomizer as defined in claim 24, wherein the actuator is mounted to said elongated body for reciprocating a drawer therealong, and wherein said drawer is connected to said head to transfer the movement imparted thereto by said actuator to said head in a direction perpendicular to said elongated body.

26. (original) An atomizer as defined in claim 25, wherein said drawer extends on each side of said head, said drawer defining a pair of inclined slots in which roller bearings extending laterally outwardly of said head are constrained to move.

27. (original) An atomizer as defined in claim 24, wherein said head moves up and down a needle valve extending at right angles from said elongated body.

28. (new) A device for lining a conduit to be rehabilitated, comprising a movable carriage, said carriage being adapted to enter and be displaced coaxially through the conduit, and a spray source rotatably mounted to said carriage for rotation about a central rotation axis, said spray source including a nozzle through which a lining mixture is forced out under pressure while said spray source is rotated about said axis and said carriage is axially displaced along the conduit, thereby providing for a uniform distribution of the lining mixture on an inner wall of the conduit, and wherein said spray source includes a rotatable crank axle having a crank lever extending at right angles from said central rotation axis and a revolving arm extending from said crank lever in parallel to said axis, said revolving arm being offset from said central rotation axis, said nozzle being mounted to said revolving arm.

29. (new) A device as defined in claim 28, wherein said crank lever is an interchangeable component of variable length.

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30. (new) A device as defined in claim 28, wherein said revolving arm is rotatable about a longitudinal axis thereof.

31. (new) A device as defined in claim 30, wherein said head is displaceable by an actuator to selectively close or open said spray source, said actuator being arranged at right angles relative to a spraying direction of the device to provide for a compact sprayer configuration.

32. (new) A device as defined in claim 31, wherein said actuator is mounted to said revolving arm for reciprocating a drawer along said revolving arm, and wherein said drawer is connected to said head to transfer the movement imparted thereto by said actuator to said head in a direction perpendicular to said revolving arm.

33. (new) A device as defined in claim 32, wherein said drawer extends on each side of said head, said drawer defining a pair of inclined slots in which roller bearings extending laterally outwardly of said head are constrained to move.

34. (new) An atomizer for spraying a fast setting lining material on a surface, the atomizer comprising an elongated body, a head mounted at one end of said elongated body and defining a mixing chamber for separately receiving the components of the fast setting lining material from separate fluid passages, said head carrying a nozzle through which the fast setting lining material is forced out of the mixing chamber, and a linear actuator extending along said elongated body for displacing said head in a direction substantially perpendicular to said elongated body between a closed position, wherein the components of the fast setting lining material are prevented from reaching said mixing chamber, and an open position wherein the components of the fast setting material are free to flow into said mixing chamber, wherein the actuator is mounted to said elongated body for reciprocating a drawer therealong, and wherein said drawer is connected to said head to transfer the movement imparted thereto by said actuator to said head in a direction substantially perpendicular to said elongated body.

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35. (new) An atomizer as defined in claim 34, wherein said drawer extends on each side of said head, said drawer defining a pair of inclined slots in which roller bearings extending laterally outwardly of said head are constrained to move.

36. (new) An atomizer as defined in claim 34, wherein said head moves up and down a needle valve extending at right angles from said elongated body.